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Does Health Matter for Economic Growth?

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Abstract. This paper reviewed extensive theoretical and empirical studies which emphasize the role human capital in form of health, in economic growth. Most of the studies used proxies like life expectancy, infant mortality rate and health expenditure to estimate the effects of health on economic growth. Majority of the studies agree the positive impact of health on the economic growth and suggest investment in health to achieve sustained economic growth.
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1. Introduction

The development of new growth theories in 1980s opened new ways for empirical research relevant to economic growth. As a result of extensive research work in the field of economic growth, human capital emerged as an important determinant of economic growth (Khan, 2012). Human capital in form of education, health, Research and Development can effect economic growth in the developing countries (Khan & Zilakat, 2015; Khan & Khattak, 2013). Knowles and Owen (1995) introduced health in economic growth model and found poor health leads to lesser human capital development which lowers productivity and results in lower economic growth[1]. Nakamura (1981), Schultz (2003), Bloom et al (2004) and, Khattak & Khan (2012) found significant role of health in economic growth.

Edwards & Grossman (1979), and Shakotko*et al* (1980) believed that health can affect cognitive development in children. Those children who haveweak family background can have lower Intelligence Quotient (IQ) than the children who are brought up in rich families. Life expectancy is considered meaningful in macroeconomic context and that is the reason which attracts the attention of economists to give priority to human capital accumulation and productivity growth (McDonald & Jennifer, 2002; Bhargava *et al*, 2001)

Oscan *et al* (2000) developed an overlapping generation model to study the role of rising life expectancy in speeding up human capital investment to achieve economic growth. The study examined the mortality decline-education relationship. Mortality decline induces investment in education and raises life expectancy. The higher life expectancy encourages schooling as returns are expected over a longer period. Empirical evidence showed a significant relationship between declining mortality and length of schooling. Lower mortality

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[1] See Simons and Alexander (1978), Behram et al (1981) and Peri (1984) for details.

also effects consumption. However, the impact is larger on consumption. The study concluded that declining mortality and increasing investment in education are the two most important aspects of economic growth. Donald & Jennifer (2002) holdthe view that education alone is insufficient proxy for human capital in the determination of economic growth. The role of different forms of capital change, with variation in income. The coefficients on investment vary inversely with level of income. The health capital seems more significant at low income and education more significant at high level of income. The study supports the view that life expectancy is meaningful in macroeconomic context. The study concludes that without health capital augmented Solow growth models produce misspecification biases and health is one of most important determinants of economic growth.

This paper intends to review the theoretical and empirical literature relevant to the effects of human capital in form of health on economic growth.

2. Method

This paper is a review paper and is based on an extensive review of existing literature which links health as human capital to economic growth. It includes both empirical as well as theoretical studies.

3. Discussion

Health is one of the most widely used measures for human capital in recent theoretical and empirical literature concerning the economic growth. Khan (2012) confirmed the significant role of human capital in form of health in economic growth. Moreover, it was found an important determinant of the growth rate of GDP per capita in selected Asian countries including Pakistan.

Berger & Paul (1989) used traditional models showing schooling-health relationships to find reasons of positive relationship of schooling to good health. The models used four different measures for health including disability, functional limitation, systolic and diastolic blood pressures. The results show that major reason for the observed education-health correlation is direct effect of schooling on efficiency of producing health. The study suggested education programmes aimed at public awareness about health in order to improve the overall health of society. Wolfe (1985) used simultaneous equation model to find the impact of poor health on school outcomes in New York. The data was collected from a sample of ill school age children and well children. The techniques of Ordinary Least Squares (OLS), Two Stage Least Squares (2SLS) and Three Stage Least Squares (3 SLS) were used. The study results show that students with chronic health diseases find problems in physical adjustment and peer communication which affects their school outcome. Those children with ordinary diseases find no problem in physical activities and do as normal children do. Special classes and tutoring have positive affect on school achievement. Health conditions which are opposed by doctor affect school attendance. The study suggested specific differences programmes to improve the process of education of those children who are facing such problems.

McMahan (1998) extended the endogenous growth theory to find the association of levels of enrollment and public as well as private expenditures on human capital with the economic growth in fastly growing economies in east Asia. The study also investigated the role of education in physical capital formation in the study area. The study finds the impact of huge initial investments in human and physical capitals highly significant in explaining economic growth in the study region. The initial investments in secondary education and public investment in secondary education provide favourable climate for investment in physical capital. The study took into account the effects of initial per capita income (PCI) and

income growth on secondary enrollments. Initial primary enrollment was also found significant. Universalization of primary education has already been attained in East Asian economies. Higher education enrollment was not found as important means of economic growth. The study suggested expenditures on secondary and higher education along with universalization of primary education.

Bhargava*et al* (2001) developed a model to find the proximate determinants of economic growth using panel data taken from Penn World Table (PWT) and World Development Indicators (WDI).Life expectancy, adult survival rates (ASR) and total fertility rates (TFR) were used to measure health. The results revealed significant positive effects of ASR on economic growth in countries like Burkina Faso, Burundi, India, Ivory Coast and Nigeria. The effects were negative in advanced countries like USA, France and Switzerland. Wang & Yudong (2003) examined the sources of growth in China during 1952-1999 by using growth accounting method. The results show a very rapid human capital accumulation in china and its contribution to economic growth and welfare remained positive and significant in the study period. Human capital accumulation was measured by average years of schooling of population of age 15-64 years. Total factor productivity also played significant role in economic growth even after the reform period in China. Physical capital accumulation accounted 51% of growth during the period 1953-1999. It contributed 25.4% to economic growth during 1978-1999. The study concluded to give high priority to human capital accumulation and productivity growth to keep china on path of sustained economic growth.

Adams (2002) examined the interrelationship of education and health in elderly persons controlling the individual and family characteristics using the OLS and 2SLS methods in USA. The sample was restricted to US born persons of ages between 51and 61 The OLS results show positive effect of educational attainment on older people. This effect is stronger in women as compared to men. The 2SLS results also show similar effects independent of omitted variables. Most of the estimates are positive and significant at 10% level of significance. The estimates which are not significant are also positive. Bloom *et al* (2004) investigated the role of good health and work experience in economic growth using a production function model of aggregate economic growth. The effect of good health proved positive and sizeable even if the work experience is kept constant. Estimation results reveal that one-year improvement in life expectancy of population contributes 4% increase in output. This fact justifies the public expenditure on health, as it will improve public health leading to raising productivity of labour. Improvements in health increase output not only through increase in labour productivity but also through human capital accumulation. The study found no evidence of greater effects of education and experience in macroeconomic studies as compared to microeconomic studies. Rico *et al* (2005) tried to find out the impact of health on economic growth using cross-country data. All factors that affect health were considered. Solow model with human capital was evaluated through panel data analysis. This study developed ordinal health index from determinants of health. The results showed a significant impact of health on economic growth of various countries. It was suggested to create higher level of mass awareness in third world countries to achieve sustainable economic growth. Health differences across countries significantly explain growth differences in these countries. Therefore, Investment in health was recommended as a macroeconomic tool in future policy making.

Hartwig (2009) applied the panel Granger-Causality framework to find whether human capital in form health caused economic growth in 21 rich countries in longrun. The results found no evidence that health expenditure or rise in life expectancy Granger caused per capita GDP growth in OECD countries. These

results are amazing as the findings in most of health-economic growth literature are against the findings of this study. The study concluded that health did not cause economic growth in longrun in study area possibly due to three reasons. Firstly, may the relationship be positive in short run. Secondly, May the time lags in this paper be too long for analytical framework. Thirdly, it is possible that people of study area may take health from welfare point of view instead of economic point of view.

Vuori*et al* (2008) developed a Working Life Group Method to find whether a single method can promote the transition of pupils from basic education to secondary or from secondary to vocational education and improve their mental health for further studies. It also aimed to find a method which may prepare them to meet challenges of rest of their life. Data was collected from a sample of 1034 students. Group method was found beneficial for the students with depression and learning difficulties either. The intervention decreased the symptoms of depression. The study found the method developed helpful especially for those who need guidance.

Khattak & Khan (2012) found that health accelerates economic growth in Pakistan and this relationship also persists in long run. It is therefore, recommended to increase expenditure on health to provide easy access to health settlements and increasing the life expectancy. The contribution of TFP should be kept in mind while developing economic policies. The R&D sector is not given much attention in Pakistan and the pace of R&D needs to be accelerated to improve the health conditions in the country and gain sustained economic growth.

4. Conclusion

Human capital emerged as integral part of economic growth in recent years. It effects economic growth in different forms. Health is one of such forms. Therefore it is concluded on basis of reviewed literature in this paper that health affects economic growth in both developing and developed countries.

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